

REMARKS

Claim 1 has been rejected under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement.

Claims 1-6 and 11-12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,242,764 to Ohba (“Ohba”).

Claims 7-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohba in view of U.S. Patent 5,771,110 to Hirano (“Hirano”).

Claims 1-12 remain pending.

Rejection of claim 1 under 35 U.S.C. § 112, first paragraph

The Office Action states that claim 1 contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Office Action further states that the Applicants have introduced new subject matter in amended claim 1 that has no support in the specification. Applicants submit that the Examiner is incorrect.

The amendment made to independent claim 1 in Applicants’ last response included the limitation “wherein the thermal radiation absorption layer is applied before deposition of the material onto the growth area of the substrate wafer”. Support for this claim amendment can be found in Figs. 1A, 1B, and 1C in connection with the corresponding description found in paragraphs 0024-0028 of the published application.

From the description recited in paragraphs 0024-0028 of the published application, it is clear that in a first method step a substrate wafer (1) is provided (par. 0024; Fig. 1A). In a second method step, a thermal radiation absorption layer is applied on the rear side (5) of the

substrate wafer (1) (par. 0025; Fig. 1B). Finally, in a third method step, a material (3) is deposited onto the growth area (4) of the substrate wafer (1) (pars. 0027-0028; Fig. 1C).

The added limitation is, thus, described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Consequently, no new matter was introduced in the amendment to independent claim 1 in the last response, and all limitations of the amended claim must, therefore, be considered with respect to the § 102(b) and § 103(a) rejections.

Applicants request reconsideration and withdrawal of these rejections in light of the following remarks.

Rejection of claims 1-6 and 11-12 under 35 U.S.C. § 102(b)

With respect to claim 1, the Office Action states that Ohba teaches all of Applicants' recited elements. It is noteworthy that in reaching this conclusion the Examiner did not consider the above-discussed added limitation alleged to constitute new matter.

Applicants' previously-amended independent claim 1 (including the limitation which was not considered by the Examiner) recites a method for depositing a material (3) on a substrate wafer (1). The method includes: (a) providing the substrate wafer (1), which has a growth area (4) intended for a later material deposition; (b) applying a thermal radiation absorption layer (2), which exhibits a good absorption of thermal radiation, on a rear side (5) of the substrate wafer (1) which faces away from the growth area (4); (c) heating the substrate wafer (1) to a deposition temperature; and (d) depositing a material (3) onto the growth area (4) of the substrate wafer (1) by an MOVPE method, wherein the thermal radiation absorption layer is applied before deposition of the material onto the growth area of the substrate wafer.

Applicants' previously-amended independent claim 1 is directed to a method that is especially suitable for growing a semiconductor material on a substrate wafer using a MOVPE technique. The thermal radiation absorption layer is applied to the rear side of the substrate that faces away from the growth area. By means of this absorption layer, the substrate wafer is heated to the deposition temperature during growth of the semiconductor material. The absorption layer permits a homogenous temperature distribution on the substrate wafer during growth of the semiconductor material.

In contrast, Ohba teaches a GaN-based compound semiconductor light-emitting element that includes an AlN buffer layer, a GaN lattice strain moderating layer, and an n-type AlGaIn contact layer formed on the layer. The GaN lattice strain moderating layer has a lattice constant larger than that of the AlN buffer layer. On the other hand, the contact layer has a lattice constant smaller than that of the AlN buffer layer. Further, the GaN lattice strain moderating layer has a thickness falling within a range of between 0.01 μm to 0.5 μm . Further, Ohba at col. 9, lines 24-28, states that "an electrically conductive material is used for forming the substrate and an electrode is mounted to a back surface of the conductive substrate, with the result that the p-side electrode can be brought into contact with a heat dissipator". Specifically, Ohba (col. 9, lines 28-32; Fig. 6) teaches that each of a SiC substrate 501 and a SiC buffer layer 503 is doped with an n-type impurity and, thus, exhibits an n-type conductivity. Also, an n-side electrode 522 is formed on the back surface of the n-type SiC substrate 501. Thus, Ohba teaches a device that has an n-side metal contact layer, and that this contact layer is applied to the rear side of the substrate.

The Examiner has applied Ohba with the contention that "the underlying layer 522 is acting as a thermal absorption layer means." In fact, however, Ohba fails to provide the slightest

hint that the contact layer 522 acts as a thermal absorption layer, let alone one that acts as a thermal absorption layer during growth of semiconductor material on a substrate. Electrode layers, such as layer 522 disclosed in Ohba, are applied to the rear side of a substrate after the device structure has been grown. Ohba fails to teach that the electrode is applied before the device structure is grown. Ohba thus fails to teach that a thermal radiation absorption layer is applied before deposition of the material onto the growth area of a substrate wafer, as recited in Applicants' previously amended independent claim 1. Therefore, Ohba fails to anticipate Applicants' independent claim 1 for at least this reason.

As discussed at paragraph 0006 of Applicants' published specification, a metal layer placed on the rear side of a substrate, such as the substrate of the structure disclosed in Ohba, would lead to contamination of the reactor gas in a MOCVD apparatus. Previously, such metal layers were not used in MOVPE (metal organic vapor phase epitaxy), because such an additional layer on the rear side of the substrate wafer could lead to the introduction of contaminants in the reactive gas space. Applicants have achieved exactly what could not previously be achieved, i.e., the application of a thermal radiation absorption layer on the rear side of a substrate wafer, wherein the thermal radiation absorption layer is applied before the deposition of a material onto the growth area of a substrate wafer, as recited in Applicants' previously amended independent claim 1. Ohba fails to teach these limitations.

In view of the foregoing, it is respectfully submitted that Ohba does not teach or suggest the subject matter recited in Applicant's independent claim 1. Specifically, Ohba does not teach or suggest a method for depositing a material on a substrate wafer wherein the thermal radiation absorption layer is applied before deposition of the material onto the growth area of the substrate wafer.

Claims 2-6, and 11-12, which depend directly or indirectly from the independent claim 1, incorporate all of the limitations of independent claim 1 and are therefore patentably distinct over Ohba for at least those reasons provided for independent claim 1.

Rejection of claims 7-10 under 35 U.S.C. § 103(a)

With respect to claims 7-10, the Office Action states that the combination of Ohba and Hirano teaches all of Applicants' recited elements.

Ohba has been previously discussed, and it is clear that Ohba does not teach or suggest the invention recited in Applicants' independent claim 1. Specifically, Ohba does not teach or suggest a method for depositing a material on a substrate wafer wherein the thermal radiation absorption layer is applied before deposition of the material onto the growth area of the substrate wafer.

Hirano discloses a method of fabricating a thin film transistor by setting the temperature of a heat treatment for crystallizing an active layer which is formed on a substrate at a level not deforming the substrate and activating an impurity layer in a heat treatment method different from that employed for the heat treatment, and a semiconductor device prepared by forming a heat absorption film, a semiconductor film, a gate insulating film, and a gate electrode on a substrate, the heat absorption film being provided within a region substantially corresponding to the semiconductor film

Because Ohba does not teach or suggest the subject matter recited in independent claim 1, and because Hirano does not teach or suggest the elements of claim 1 that Ohba is missing, the claimed invention is patentable over the combination of these references.

Claims 7-10, which depend directly or indirectly from the independent claim 1, incorporate all of the limitations of independent claim 1 and are therefore patentably distinct over Ohba and Hirano for at least those reasons provided for independent claim 1.

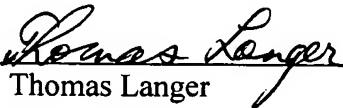
Conclusion

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of all rejections, and allowance of all pending claims in due course.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,

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